Claim Listing This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1 – 22 (canceled)

Claims 23 – 34 (canceled)

Claim 35. (previously amended) A composition useful for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity in a biological sample comprising a synthetic peptide substrate selected from the group consisting of Glu Pro Pro Leu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 11), Glu Pro Pro Gln Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 15), Glu Pro Pro Leu Thr Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 16), Pro Glu Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 18) and Pro Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 19).

Claims 36 – 52 (canceled)

Claims 53 – 98 (canceled)

99. (currently amended) A kit for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity, comprising:

(a) a phosphate donor;

(b) a composition useful for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity in a biological sample comprising a synthetic peptide substrate selected from the group consisting of ~~a composition useful for~~

~~specific detection and quantitation of DNA-PK which comprises a synthetic peptide substrate defined by the following features to provide specific recognition and phosphorylation by DNA-PK: (1) a one phosphate-accepting amino acid pair selected from the group consisting of serine-glutamine (Ser-Gln) (SQ), threonine-glutamine (Thr-Gln) (TQ), glutamine-serine (Gln-Ser) (QS), or glutamine-threonine (Gln-Thr) (QT); (2) enhancer amino acids, selected from the group consisting of glutamic acid or glutamine, immediately adjacent at the amino- or carboxyl- side of the amino acid pair and forming an amino acid pair-enhancer unit; (3) a first spacer sequence at the amino terminus of the amino acid pair-enhancer unit; (4) a second spacer sequence at the carboxyl terminus of the amino acid pair-enhancer unit, which spacer sequences may include any combination of amino acids that does not provide a phosphorylation site consensus sequence motif for another protein kinase; and (5) a tag moiety, which may be an amino acid sequence or another chemical entity that permits separating the synthetic peptide from the phosphate donor; and~~Glu Pro Pro Leu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 11), Glu Pro Pro Gln Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 15), Glu Pro Pro Leu Thr Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 16), Pro Glu Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 18) and Pro Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 19); and

(c) a means for detecting a phosphorylated synthetic peptide substrate, whereby detection of said phosphorylated synthetic peptide substrate is utilized to determine an amount of DNA-PK activity in said biological sample.

100. (original) The kit of Claim 99, wherein said phosphate donor is ATP.

101. (canceled)

102. (currently amended) The kit of ~~Claims~~ Claim 99, further including a negative control peptide selected from the group consisting of Glu Pro Pro Leu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 20), Pro Glu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 23), Glu Pro Pro Leu Ala Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 21), Pro Glu Glu Ala Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 24) and Pro Glu Glu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 25).

103. (original) The kit of Claim 99, further including buffers.

104. (original) The kit of Claim 99, further including a preparation of DNA-PK.

105. (original) The kit of Claim 99, further including a reagent to detect a phosphorylated peptide substrate.

Claims 106 – 111. (canceled)